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**TITLE: BODY SUPPORTING, SERIAL INFLATING SEAT**

This is a utility patent application based on a provisional patent application (Serial No. 60/268,598) filed on February 13, 2001.

**BACKGROUND OF THE INVENTION**

1. Field of the Invention:

This invention pertains to seat cushions, and, more particularly, to seats having inflatable air bladders that inflate sequentially to promote upward blood flow in the user's legs while sitting.

2. Description of the Related Art:

It is well known that prolonged sitting in a car, on a plane, or in a chair inhibits blood flow from the legs to the heart, resulting in leg discomfort. Constant pressure is applied by the seat to the back of the legs, physically blocking venous flow. Blood begins to pool in the legs which eventually causes discomfort. Intermittent pressure relief for the back of the

1 thighs and buttocks is required to prevent fatigue, skin breakdown, and blood clot formation.  
2 Special mechanical and weight limitations often prevent adequate leg movement to relieve  
3 such pressure on the thighs.

4 Heretofore, seat cushions containing inflatable bladders to vary the pressure points on  
5 a person's legs and buttocks have been developed (see U.S. Patent Nos. 6,098,000,  
6 6,092,249, 6,088,643, 6,088,642, 6,041,784, 5,881,407, 5,687,099, 5,678,891, 5,487,197,  
7 5,379,471, 5,029,939, and 4,840,425). However, none of these seat cushions provide  
8 transversely aligned bladders that inflate individually and sequentially from front to back to  
9 promote venous blood flow in the legs. Also, none of these seat cushions include features  
10 that prevent slippage of the user's buttocks over the seat when the bladders are inflated.

11 What is needed is a seat cushion with transversely aligned and sequentially inflated  
12 air bladders that apply pressure to the back of the legs to promote venous blood flow in the  
13 user's legs when sitting, and include means to prevent forward movement of the user's  
14 buttocks over the seat during use.

## 16 SUMMARY OF THE INVENTION

17 It is an object of the present invention to provide a seat or seat cushion with inflatable  
18 bladders that inflate sequentially from front to back to promote venous blood flow in the legs.

19 It is another object of the present invention to provide such a seat or seat cushion that  
20 allows the sequentially inflated bladders to remain inflated for a sufficient amount of time  
21 before deflating so that blood is forced upward through the veins.

22 It is a further object of the present invention to include means to prevent forward

1 movement of the user's buttocks over the seat during use.

2       These and other objects of the invention which will become apparent are met by an  
3 anti-edema, blood-flow-promoting seat comprising at least three transversely aligned,  
4 inflatable air bladders connected to a pump and timer. The bladders are inflated sequentially,  
5 from front to back, over a period of approximately eleven seconds and simultaneously  
6 deflated to slowly pump blood upward in the legs thereby reducing blood pooling. The cycle  
7 is then repeated continuously. Located adjacent to the back air bladder is a transversely  
8 aligned, non-inflating seat cushion which continuously supports the user's ischial tuberosities  
9 while sitting to prevent forward movement of the user's buttocks over the seat while the  
10 bladders are inflating and deflating. An alternate embodiment offers a split seat option with  
11 six inflatable bladders. The six inflatable bladders are divided into two sets of inflatable  
12 bladders located on opposite sides of the seat. The user is able to independently control each  
13 set of bladders so that all of the bladders in both sets or in each set are constantly inflated,  
14 constantly deflated, or sequentially inflated and deflated.

## 16                   BRIEF DESCRIPTION OF THE DRAWINGS

17       Fig. 1 is a perspective view of a seat with the serial inflated air bladders constructed in  
18 the seat.

19       Fig. 2 is a perspective view of the seat shown in Fig. 1 with the air bladders in a fully  
20 deflated condition.

21       Fig. 3 is a side elevational view of an individual sitting in the seat shown in Figs. 1  
22 and 2 showing the relative position of the individual's leg against the air bladders.

1 Fig. 4 is a top plan view of one embodiment of the seat member having three  
2 expansion bladders.

3 Fig. 5 is a top plan view of a second embodiment of the seat member having six  
4 expansion bladders.

5 Fig. 6 is a side elevational view showing the sequential inflation of the air bladders.  
6

### 7 **DESCRIPTION OF THE PREFERRED EMBODIMENT(S)**

8 Referring to the accompanying Figs. 1-6, there is shown and described an anti-edema,  
9 blood flow promoting seat 10 comprising at least three transversely aligned, inflatable air  
10 bladders 11, 12, 13 connected to a pump 30. The air bladders 11, 12 13 are inflated  
11 sequentially as shown in Fig. 6, from front to back, over a period of approximately eleven  
12 seconds, and simultaneously deflated to slowly pump blood upward in the user's legs 90  
13 while sitting, thereby reducing blood pooling.

14 Located adjacent to the rear air bladder 13 is a transversely aligned, non-inflating seat  
15 cushion 20 designed to continuously support the user's ischial tuberosities while sitting.  
16 During use, the non-inflating air cushion 20 prevents forward movement of the user's  
17 buttocks over the seat 10 while the air bladders 11, 12, 13 are continuously inflated and  
18 deflated.

19 In the preferred embodiment, the air pump 30 and timer 40 are assembled in an  
20 enclosed air control unit 25 similar to the controller disclosed in U.S. Patent No. 4,253,449  
21 and incorporated by reference herein. The unit 25 supplies pressurized fluid through a  
22 conduit system 50 to the air bladders 11, 12, 13.

1       The unit 25, shown more clearly in Fig. 4, includes an electric air pump 30 controlled  
2 by an on-off button 34 that supplies constant air pressure when activated. A main conduit 36  
3 connects the air pump 30 to a valve 35 that controls the distribution of the air through branch  
4 conduits 37, 38, 39 from the air pump 30 to a combination inlet/outlet port 21, 22, 23 on the  
5 bladders 11, 12, 13, respectively.

6       The timer 40 controls the sequence of filling the air bladders 11, 12, 13, the length of  
7 time for inflation, the length of time of holding, and the length of time for deflation. By  
8 controlling these three parameters, the air bladders 11, 12, 13 are sequentially inflated to  
9 press against the thigh and cause flow of blood in the veins toward the body. In the preferred  
10 embodiment, the timer 40 is set so that the air bladders 11, 12, 13 sequentially inflate over a  
11 period of approximately eleven seconds.

12       In Fig. 5, the second embodiment of the invention is shown with two sets of inflatable  
13 air bladders 11, 12, 13, and 14, 15, 16, respectively, aligned on opposite sides of the seat 10.  
14 The first set of air bladders 11, 12, 13 is connected to the manifold 55. The second set of air  
15 bladders 14, 15, 16 is connected to a second valve 80. A large capacity control unit 65 with a  
16 larger pump 70 is used in this embodiment. A transversely aligned conduit 75 connects the  
17 second control unit 65 to the second valve 80 designed to sequentially inflate the air bladders  
18 11, 12, 13 and 14, 15, and 16 on opposite sides of the seat 10 via branch conduits 81, 82, 83.  
19 The control unit 65 includes an optional control switch 64 that enables the user to  
20 independently control the two sets of inflatable air bladders 11, 12, 13 and 14, 15, 16. The  
21 user is able to independently control each set of bladders 11, 12, 13, and 14, 15, 16 so that all  
22 of the bladders 11, 12, 13, and 14, 15, 16, in both sets or in each set are constantly inflated,

1 constantly deflated, or sequentially inflated and deflated.

2       In compliance with the statute, the invention described herein has been described in  
3 language more or less specific as to structural features. It should be understood, however,  
4 that the invention is not limited to the specific features shown, since the means and  
5 construction shown, comprised only of the preferred embodiments for putting the invention  
6 into effect. The invention is therefore claimed in any of its forms or modifications within the  
7 legitimate and valid scope of the amended claims, appropriately interpreted in accordance  
8 with the doctrine of equivalents.